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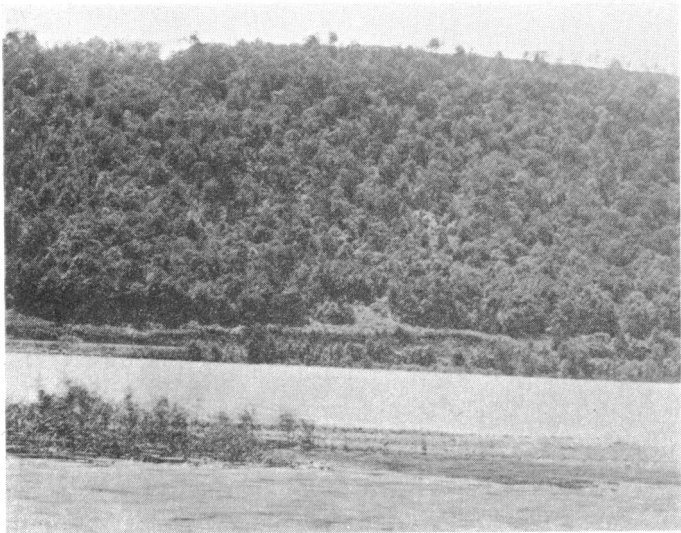


LAKE Pepin is caused by the delta of the Chippewa River, which dams up the Mississippi. It is thirty miles long and has an average depth of about twenty-five feet. Its waters support many fishes and clams which are of commercial value. In order to give a picture of the life of the fishermen, the routine of a typical day at the end of June is described.

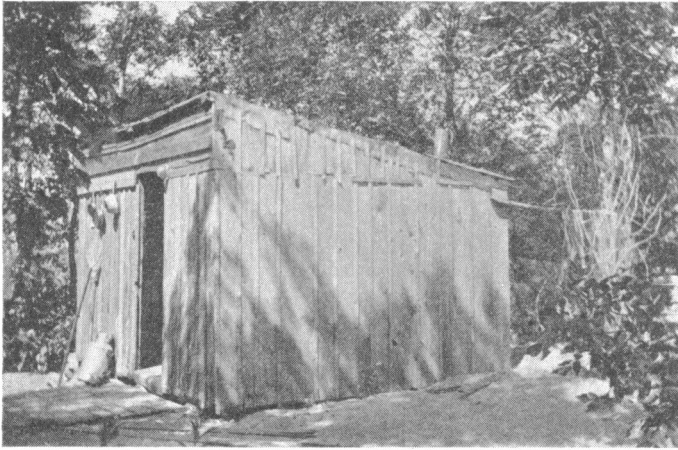
The wren that lived in the tomato can we had nailed to the tree beside our shack sang at four o'clock, as usual. I lay in my cot and drowsily thought of Chaucer's couplet:

And small foules, a great hep,
That had afroyed me out of slepe.

The wren sang again and then I heard the lapping of the river on the sand. The water sounded so near that I peeked over the side



THE MINNESOTA BLUFFS

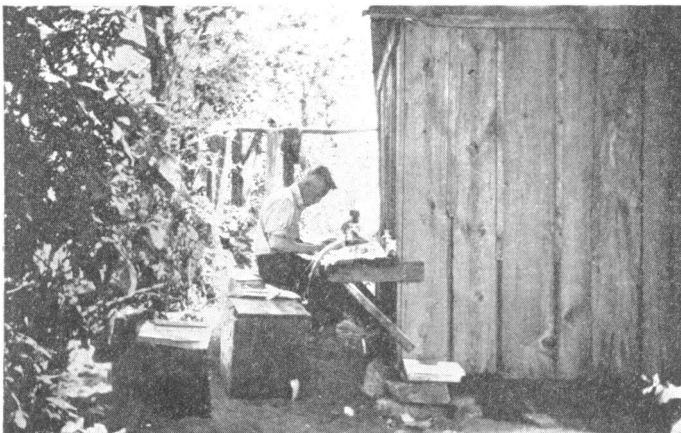


OUR HOME FOR A MONTH

of the cot to see if it was in the shack, but the floor was dry. With clothes in one hand and boots in the other, I sneaked out on our front porch, which consisted of a barn door that we had salvaged from the river. The mighty provider of porches had risen eight inches during the night and was busily engaged in hurrying trees, logs and all sorts of riff raff toward New Orleans.

The sun touched the Minnesota bluffs. Ghostly clouds of mist crept over Lake Pepin. I pulled on my boots and washed. The wren sang some more. Another day had begun.

I ate my breakfast, then rubbed the spoon and pan in the sand at the margin of the river, rinsed them at the pump, and stood them on the table to dry. We rejoiced in a regular cistern pump, which, driven in the sand, gave us plenty of clear, cool water. The Israelites with Moses were no more appreciative than we!



OUR LABORATORY

I slid the skiff gently into the river and pulled against the current out on Lake Pepin. As I left our cove, I could hear the "put-put" of Earl's engine as he brought his launch around to take out the scow. At night Earl always put the launch in the slough behind the bar, safe from storms. He had a fine start this morning and should, with luck, have his seine out at ten o'clock.

The gill nets did good work. They had been set in the deepest part of the lake (55 feet) and I was rewarded for the long pull with sixteen hacklebacks,¹ two saugers, a channel cat, and two clams. There was a big carp in the two-inch mesh net and I got him to the very surface of the water. But the net was rotten and he was caught only by the saw-spine on his dorsal fin. Just as I was slipping the dip net under him—a mighty flop, and he was gone! The clams were without pearls, too. But we would have hackleback for dinner!



OFF TO SET THE SEINE

As I rowed back to camp, Earl and his crew were loading the big seine into the scow. The lake had been rough the day before, and the seine was badly tangled in the brush. Charley had his waders on and was towing the scow along the shore by hand while the others stowed the seine.

At the shack I found Tasche—wide awake, full of breakfast and ready to go out to the trot-line. Jean was already spearing carp. As soon as my catch was unloaded, Tasche jumped into the skiff and rowed away up the big slough. I had scarcely taken care of

¹ Sand-sturgeon, *Scaphyrhynchus platorhynchus* (Rafinesque).

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HAULING THE SEINE

the fishes from the gill net and straightened up the shack a little, when he was back. I knew by the splash of his oars and the set of his back that he had something. But we went through the regular formula for such occasions. I hailed:

What luck?

Pretty fair.

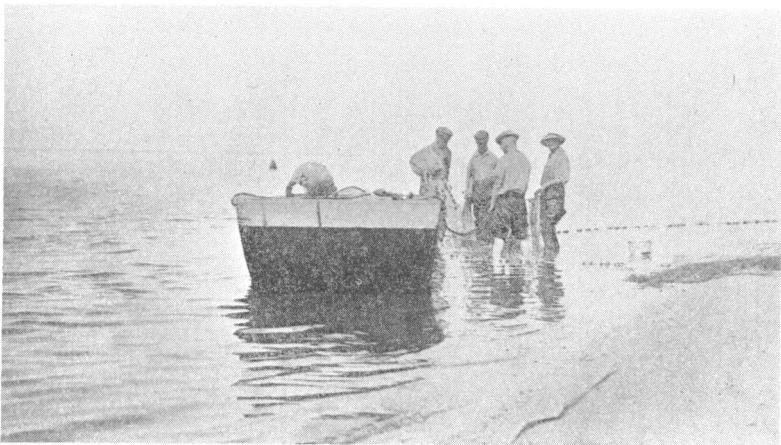
The skiff dug its nose into the sand and Tasche said,
Got some more channel-cats.

How many?

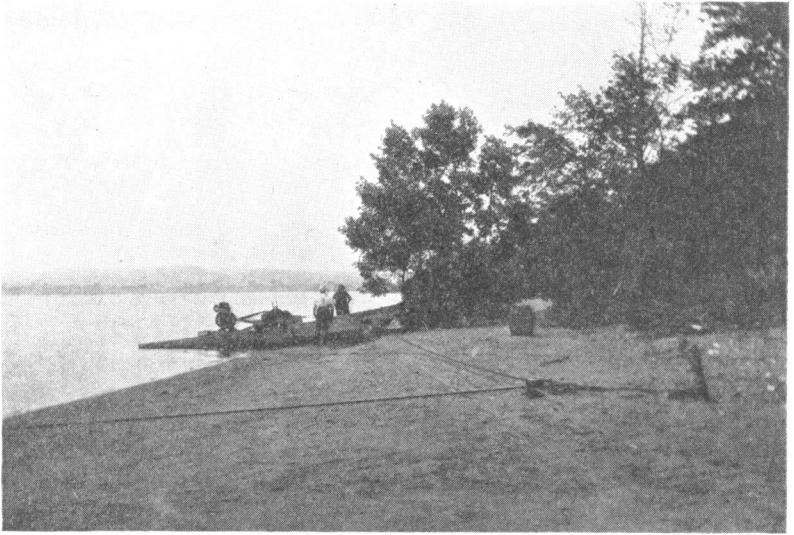
Three. One of them about five pounds.

Anything else?

Why, yes. I got an eel!



DIPPING THE HAUL INTO THE SKOW



HAULING THE SEINE

With a whoop I ran down the beach. This was the only eel we got all summer! It was a fine old fellow, about three feet long. Tasche held it up, still attached to a leader from the trot-line.

"I was afraid to take him off. He's too slippery to hold!", he said.

It was a strange fish with a strange history—hatched in the Atlantic Ocean and caught a thousand miles up the Mississippi. We made a hasty examination of the eel and put the other fishes in the "live car" for future study. We were anxious to be at the hauling of the big seine.

As it turned out we had plenty of time, for the seine was not quite loaded when we reached the lake. It was soon on board the scow, however, and five minutes later Earl was towing it out into the lake. Earl handled the launch and Floyd, on board the scow, watched the line that was fastened to a tree on shore and "paid out" as they went along. When the line was out, Earl turned his course parallel to the shore to spread the seine. The great net was 2,000 feet long and 28 feet deep. The mesh was two and a half inches, bar measure; except a hundred and fifty feet in the center, which was two inches. After the net was out, Earl turned directly toward the shore while Floyd paid out another hauling line.

Floyd waded ashore with the end of the line, slipped it through a pulley which was lashed to a sturdy stump, and then handed it to Charley. That worthy took a couple of turns around the wheel of his hoisting engine—already popping away at a good rate.

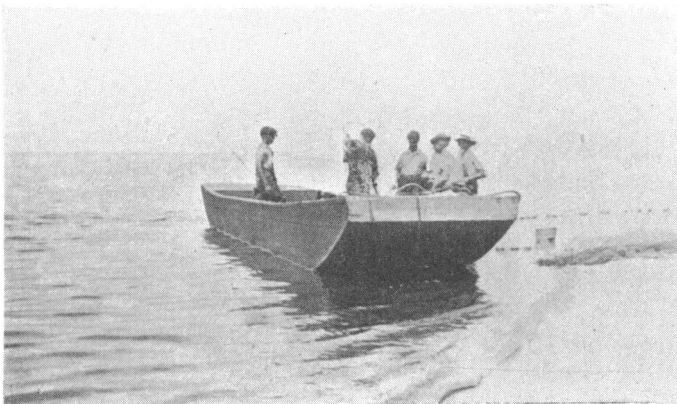
The hauling of the seine took about two hours. First a long

line came ashore and was neatly coiled. Then the wooden brail at one end of the net appeared above the water. Two of the boys pulled a hauling line down the beach to where the line from the other end of the net was fastened. They rigged another pulley and, without moving the hoisting engine, began hauling again. Another line was coiled down and finally the brail at the other end of the net crawled slowly up the beach.

When the brail got almost to the pulley, George threw the line off the engine and the hauling stopped. Earl took the end of the line out into the lake until the water was above his waist, stuck his toe under the bottom of the net and raised it so that he could grasp it with his hands. The hauling line was made fast to the lead line. Earl signaled to George and the net began to come on shore. Floyd and Charley took stations about thirty feet away from the water on either side of the net, which they stretched and piled down neatly on the sand to dry. Every time the knot on the lead line came up to the pulley, Earl waded out and fastened the hauling line further along the net.

Earl was "boss" because he was, physically and mentally, the best man of the crew. He had travelled all over the United States and served in France during the war. At thirty-three he had come back to his old home on the Mississippi and settled down to spend his life as a seiner—because he loved the outdoors and fishing, and rejoiced in hard work as a strong man should. He always took the hardest tasks; and indeed no other in the crew could do them as well. Altogether Earl was as honorable and rough and fair and profane and instinctively courteous as one could wish—a real man who asked no favors and expected to give none, but would when you least expected it.

When nearly half the net was in, the hauling line was changed



DIPPING THE HAUL INTO THE SKOW



DRYING THE NET

to the other end and another period of stretching and piling ensued. At ten o'clock there were only a few hundred feet of the seine left in the lake. Earl waved his arms and George stopped the engine. All the crew then began pulling in the "center" by hand. As the space between the seine and the shore grew narrower, the fish began to flop. A twenty-pound carp flipped over the top of the seine and Earl yell to old Charley,

"Hold up that cork line! G——! They'll go like a flock of sheep." And Charley "held up."

"There's a big spoonbill!" said George. "They've been awful scarce this year. Twenty years ago we used to get a thousand pounds a day."

"Shut up," said Earl. This was no time to spin yarns.

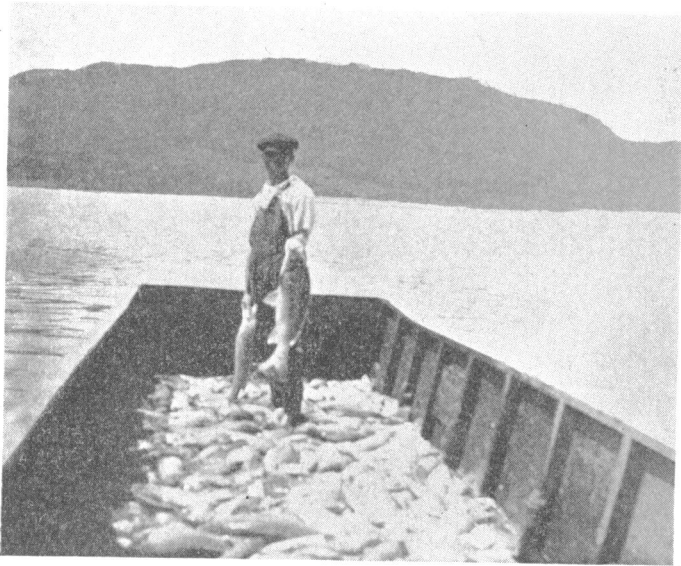
Finally the net was in and the crew gathered around in a little circle, holding the edges of the net well above the water so that no



LOADING THE NET ON TO THE SKOW

high jumper could escape. Tasche and I lent a hand while Floyd brought up the scow. Then Earl took a dip net, stepped among the flopping fishes, and "ladled" the catch into the scow.

There were many carp weighing from fifteen to twenty pounds—great, glittering, golden fellows that taxed even Earl's sturdy muscles. There was also a good number of sheepshead, river carp (which the Lake Pepin fishermen call "white carp"), red horses, and a mud cat—all marketable fishes. The prize of the day was a forty-two pound spoonbill. At the tail of the catch were about sixty mooneyes—beautiful, silvery fishes—which Earl saved. Mooneyes are not fit for human food, but are ground up and used as an ingredient of chicken feed.



THE HAUL

The game fishes were all put back into the water as soon as possible. It fills an unsuccessful fisherman with regret to see ten-pound pickerel and wall-eyed pike cast back into the lake. George also threw back about fifty black bass, white bass, blue-gills, and crappies.

As soon as the catch was all on board the scow, Floyd jumped into the flopping mass and began putting the small carp and buffalo back into the lake. He also recovered a few game fishes that had not been previously thrown out. Earl meanwhile was bringing up the launch and before Floyd had all the "culls" overboard he was on the way to Pepin. In half an hour after the catch left the net it was on ice in Jim Broatch's fish house, and that evening some of



THE NET IS IN

the fishes were on sale in Minneapolis and Chicago. The best part of the catch, however, was sold in St. Louis and New York two or three days later.

After the "haul" had gone to town, Charley and George pulled in the center of the net and spread it neatly on the sand. A big pike had turned belly up and was floating along the beach.

"He'll never live," said Charley. "I believe I'll cook him for dinner."

"What sort of fish do you fellows usually eat?" I asked. Charley evidently thought I was too curious on short acquaintance and did not answer. George, however, who could not forego an opportunity to say something, after pondering a moment said, "Well, we mostly eat carp and sucker."

Tasche and I went back to the shack. As we came down the shore a big softshell turtle ran from a sand bar where she had been digging a nest. She scuttled awkwardly but swiftly down to the water, leaving a trail like a caravan.

We dined on fried sturgeon at our table under a willow tree. For dinner, sturgeon is the king of all fresh-water fishes. After the skin is off and the "chord" has been pulled out, there are no bones. The flavor is delicious and, when well cooked, a sturgeon "melts in the mouth."

The softshell climbed out on the bar again while we ate. She found a spot that suited her and began to throw spurts of sand out behind. We tried to slip away from the table without being noticed, but she gave us one neck-stretching look, then tore down the beach and disappeared into the water with a grand splash. We saw her no more.

After dinner we went up to the seiners' shack and talked a while. Sitting on the sand we had a magnificent view across the river to the tree-covered Minnesota bluffs, which tower four hundred feet above the water. As we talked scores of swallows hunted over the bars. Floyd spent all his leisure whittling. Today he was working on an American eagle perched on a ball. He finally cut a great gash in his finger and Earl tied it up. Talk drifted on from women to high prices, and from high prices to war, and finally to fishing. I asked the boys concerning the number and variety of fishes they caught in the big seine. After some debate Earl made the following estimate of the average catch per day during the season (June 15 to November 15), and the others agreed that it was "about right:"

Carp, both "German" and "river".....	500 lbs.
Dogfish (1,000 lbs. on some days in autumn).....	400 lbs.
Sheepshead	350 lbs.
Suckers and redhorses.....	200 lbs.
Wall-eyed pike	200 lbs.
Mooneye	100 lbs.
Pickrel	50 lbs.
Buffalo	25 lbs.
Spoonbill	25 lbs.
Catfishes and bullheads.....	25 lbs.
White bass	10 lbs.



LOADING THE NET ON THE SKOW



THE SEINING CREW

Black bass (two species).....	10 lbs.
Bluegill	1 lb.
Crappies	1 lb.

At three o'clock the crew started loading the seine into the scow. Tasche and I got out the minnow seine and dragged along the shore to catch bait for the trot line. We caught a lot of shiners, a few little suckers, about two hundred log-perch, and a tadpole cat. While we were seining Jean came back from the sloughs with



CHARLEY

thirty-two carp that he had speared. Once he had lunged too far and slid over the bow of his boat. His clothes were still wet—and his language scandalous! Jean cleaned his catch and left for Pepin, where his carp would soak in brine overnight and be ready for smoking the next morning.

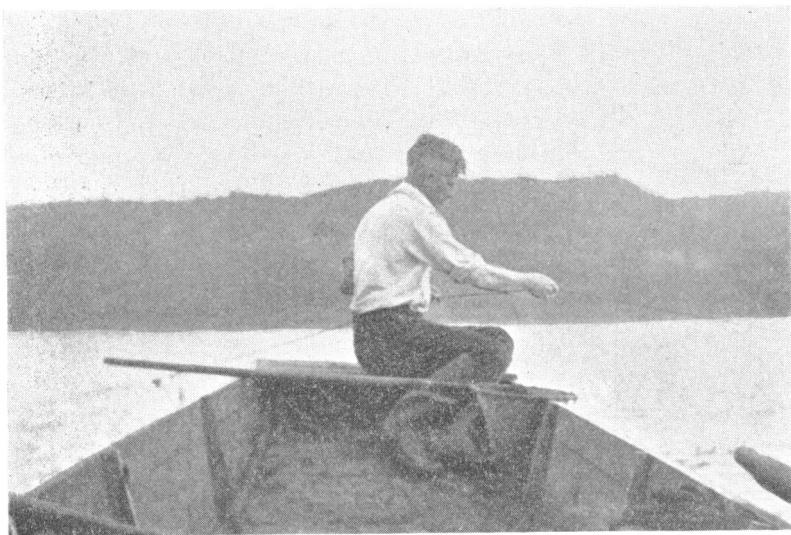
A fly fisherman tried his luck past our shack. He was an aristocrat among fishermen, with a man to row for him and a beau-



TASCHE WITH HIS CATFISHES

tiful outfit, and he knew his business. Drifting along near shore, his fly fell forty feet away in the exact spot that he chose and it flickered over the water in a way to make any bass long for it. We did not begrudge this fisherman the two fine bass that came into his landing net. He deserved them!

After supper Tasche rowed up into the slough and set the trot line. I sat by the fire, cooking rice and dried apples for breakfast. Before nine o'clock we had our cots set up and were spreading



TASCHE "RUNNING" THE LINE

our soggy garments out for the night. As I dozed off the hoot owl started his nightly refrain.

And snale foules maken melodie
That slepen alle night with open eye.

The United States has resources of great commercial value in its larger lakes and rivers. Though there are many fishes in swamps, creeks and ponds, such small bodies of water can never furnish great enough numbers to be of value to commerce. Their resources should be conserved, however, for the sportsman and small boy. Every fish caught on a hook and line probably costs dollars in tackle and time, but it is worth what it costs in health and the wealth of spirit which accrues to those who live outdoors.

There has always been some conflict of interests between those who fish for the market and those who fish for sport or to get a fresh dinner. The one wants a continued supply of large fishes; the other is after a few fine specimens that he can show his neighbor with pride—caught by himself! There will always be these two classes of fishermen and civilization must keep a place for them.

The citizens of the United States have already committed some errors in the administration of the fisheries resources in the Mississippi River. Aggressive and interested sportsmen have secured the passage of certain laws; those concerned in making money have fathered concessions which helped their business. There has been a deal of prejudice, misunderstanding, and thoughtlessness. To a scientist, such conflict seems unnecessary.

The "ultimate" food resources for the animals in the Missis-

issippi are in the aquatic vegetation. Water plants, given solar energy, can make living substance from minerals, water, and carbon dioxide. As animals cannot do this, they depend on plants for food, directly or indirectly. The Mississippi River itself does not contain many plants. Its bottom shifts too rapidly and its water is usually too turbid to permit the passage of solar energy to any except very shallow depths. Its chief value for fishes is as a highway through which passage is permitted to the great stores of food in tributary swamps, ponds, and other situations where plants flourish.

What are the foods of the chief commercial fishes? The carp is omnivorous, but its food is chiefly vegetation. It does great damage to aquatic plants, grubbing up wild celery and other plants which might afford food and shelter for ducks and game. Its best feeding grounds are in swamps. The dogfish feeds largely on crawfishes and minnows. The sheepshead eats snails, clams, and mud. The suckers and red horses feed chiefly on mud and the small organisms associated with it. All these fishes of commercial importance as food do injury to man. The carp destroys vegetation; the dogfish eats game fishes; the sheepshead, and to some extent the carp, devour many young clams which might otherwise grow large enough to be made into buttons. Suckers and carp follow other fishes when spawning and eat their eggs. In all respects it is desirable that the resources represented by these four



TASCHE AND THE EEL

food fishes be conserved, by preserving swamp areas and sloughs, and it is also desirable to keep catching the larger fishes continually in order to check the injury they may do. The sportsman who talks of prohibiting seining, while fishing by "sportsman's" methods continues, is advocating the unchecked increase of "rough" fishes which will compete with the game fishes in aquatic habitats. Wise, supervised seining is one of the best means of increasing game fishes.

The fishes the sportsman most loves are insect and fish eaters. Both the favorite foods of these fishes are usually associated with aquatic plants. The bass hunt among aquatic vegetation for immature insects and skim the surface for adults; the pickerel and pike lurk along the margins of water gardens, ready to snap up any small fish that passes. These fishes are most often found where water plants grow abundantly.

There have been marked changes in Lake Pepin during the past decade. Time was when a seiner caught a thousand pounds of spoonbills every day and when buffaloes were second in commercial importance only to spoonbills. Big sturgeon were also common. Now these fishes are scarce; the carp, sheepshead and, once despised, dogfish have taken their places in the markets. Fish epicures have been obliged to lower their standards. The causes of the decrease of the more desirable food fishes is uncertain. Perhaps overfishing, the introduction of the carp, the pollution of the river by industrial wastes, and the construction of dams have contributed, but there is no satisfactory scientific explanation.

A great natural asset like Lake Pepin should be appreciated—natural reservoir, source of free food for the poor man, livelihood for the fisherman, recreation for rich and poor. It is worth much to the nation. The Mississippi is an opportunity—for science to gain a knowledge of causes, for the government to conserve and improve valuable resources.

